

REMARKS

Reconsideration of the above-identified application in view of the amendments above and the remarks following is respectfully requested. Claims 1-32 are currently pending in the application.

Claims Rejections – 35 U.S.C. 103

Claims 1-3, 22, and 27-28 were rejected under USC. 103(a) as being obvious over Iwatsuki et al (hereinafter: *Iwatsuki*) U.S. Patent Application No. 2003/0197772 in view of Morita et al (hereinafter: *Morita*) U.S. Patent No. 6,879,378. In the light of the Examiner's remarks, in order to emphasize the inventiveness of the present claims in the light of the prior art, Applicant has amended independent Claims 1 and 22. Applicant believes that now the amended Claims 1 and 22 involve an inventive step over the cited references, distinguishing the invention from the prior art. No new matter has been added as will be explained below.

In the response to the USPTO Action mailed Jun 30, 2006 Applicant argued, *inter alia*, that the array of inkjet nozzles of the claimed invention is designed to be static during the printing operation, while the *printing table assembly* is designed to move forward and backward and that *Iwatsuki*, on the other hand, describes a platen device, such as the *printing table assembly*, and a printing head, such as the array of inkjet nozzles, which are reciprocally actuated during the printing operation. In particular, Applicant argued that *Iwatsuki* printing head is not designed to be static while ink is delivered on the moving printed substrate during the printing process.

In the USPTO Action mailed January 25, 2007 the Examiner expressed his position regarding the Applicant's response:

"The applicant's argument is over commensurate the scope of the claim invention because the claim language does not define wherein the ink jet printhead delivers ink on the passing printing table assembly."

In addition, the Examiner expressed his position that:

"Iwatsuki's Fig. 1 shows that during the forthward movement of the table assembly to locate an unprinted fabric to a desired position for the printhead to start printing or during the backward movement of the printing table to a position to unload the fabric after printed, the Ink jet printhead is static".

Applicant has amended Claim 1 in accordance with the Examiner's position and the claim language now defines an inkjet printing head that applies ink on a media loaded on the printing table assembly, wherein during the applying the printing table assembly passes by the inkjet printing head in back and forth movements and the inkjet printing head is substantially static on said linear Y axis.

In particular, amended Claim 1 now explicitly defines:

"...a linear motion Y axis stage mounted on said frame perpendicular to said first and second linear motion X axis stages, above said printing table assemblies; and

an array of inkjet nozzles for applying ink on a media loaded on said printing table assembly, said array of inkjet nozzles being mounted on said linear Y axis stage for linear motion perpendicular to said X axis stage;

wherein during said applying said printing table assembly passes by said array of inkjet nozzles in said back and forth movements and said array of inkjet nozzles is substantially static on said linear Y axis."

The *linear Y axis stage* of some of the present embodiments is designed to allow static positioning of the *array of inkjet nozzles* by several print passes while applying ink on a media loaded on said printing table assembly process, see page 9, lines 10-15 and Figs. 6a-c. The *linear X axis stage*, on the other hand, is designed to allow the moving of the *printing table assembly*, which is loaded with a printing media, back and forth by the drop-on-demand inject nozzles of the *array of inkjet nozzles*. In such a manner, the *array of inkjet nozzles* is static on said linear Y axis when it applies ink on the media during the aforementioned back and forth movements. Such a configuration is used in order to deal with the effect of acceleration on ink feed to the nozzles that exist, inter alia, in Iwatsuki. On the other hand, in *Iwatsuki* the reciprocal movement of the printing head in relation to the movement of the printed substrate requires high accelerations on the printhead and on the printed substrate that cause ink flow irregularities. Therefore, high accelerations of the printhead, above the substrate, may reduce the quality of the image, which is printed on the substrate because the acceleration interferes with the feed of ink to the nozzles. The quality of the printed image is reduced as smearing and white striping may incur during the printing process if the acceleration forces experienced by the printhead or the platen device exceeds a certain speed level.

Such a force (acceleration) limitation does not apply when the printing is performed using the claimed invention. In the claimed invention, the printhead, which is *an array of inkjet nozzles*, is designed to be static on said linear Y axis when it applies ink at selected spots on the printed substrate and the accelerations of the printhead are transferred to the printed substrate. As the *array of inkjet nozzles* is static on said linear Y axis during the printing process, the flow of ink into the nozzles is smooth and the

printed image on the printed substrate is not smeared as happens when ink is delivered by a moving *array of inkjet nozzles*, for example in *Iwatsuki*, see paragraph [0065] of the present application.

The Examiner is of the opinion that in the light of *Iwatsuki* and *Morita* it would have been obvious to the one having ordinary skill in the art, at the time the invention was made, to modify the *Iwatsuki's* printing device to include a second table/stage that operates independently from the first table/stage as disclosed by *Morita*.

Basically, *Morita* discloses an exposure apparatus for use in exposure of plate-type units, such as printed circuit boards, and a method of conveying a mask and a work, see lines 49-59 in column 3, first paragraph of *Morita*. Thus, it is clear that *Morita* does not encounter the aforementioned force (acceleration) issue, which is explicitly related to the printing industry. As neither *Morita* nor *Iwatsuki* discloses or implies the force (acceleration) issue, it is clear that the combination thereof cannot result in the present invention.

It should be noted that in order to establish a *prima facie* case of obviousness, the prior art references, when combined, must teach or suggest all the amended claim 1 limitations (*In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). As elaborated above, the cited references and the combination thereof do not teach or suggest the feature of *applying ink on a media loaded on said printing table assembly, wherein during said applying said printing table assembly passes by said array of inkjet nozzles in said back and forth movements and said array of inkjet nozzles is substantially static on said linear Y axis*, which is disclosed in amended Claim 1. Therefore, no *prima facie* case of obviousness is established regarding the amended claim limitations.

Another criterion for establishing a *prima facie* case of obviousness is that there must be some teaching, suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings:

In the USPTO Action mailed January 25, 2007 the Examiner expressed his position that:

"The motivation to combine Iwatsuki and Morita would have been to be able to alternately transfer the tables between loaded/unloaded position and an image/pattern forming position and alternately form images/patterns on the table so at least two workpieces can be processed simultaneously in order to increase throughput, as taught by Morita."

Applicant strongly urges that the Examiner erred in asserting that *Morita* teaches a system that allows simultaneous processing of at least two workpieces in order to increase throughput. The Examiner position is in direct conflict with the express and explicit teaching of *Morita's* semi-automatic device for "conveying a mask and a work" which is designed to *achieve effective utilization of the limited inner space of the exposure apparatus as well as provides a smaller-sized exposure apparatus* and not to increase throughput, see lines 1-5 in column 5 of *Morita*.

Moreover, the nature of the problem to be solved of the cited references and the claimed invention is completely different. The claimed invention discloses, *inter alia*, a machine with two linear motion X axis stages. Each one of the linear motion X axis stages is parallel to one another and *arranged for allowing independent operation*, as explicitly disclosed in Claim 1. Such an embodiment indeed, *inter alia*, increases the printing process throughput as it allows, *inter alia*, the process of loading and unloading

to be carried out on one printing assembly at the same time that printing is being carried out on the second printing assembly. On the other hand, *Morita* discloses an exposure apparatus that includes a semiautomatic exposure apparatus and two exposure tables, which are conveyed along a loop in an endless manner. *Morita* explicitly defines the nature of the solved problem in eleven advantages of the exposure apparatus, see line 55-67 in column 16, column 17, and column 18 of *Morita*. None of the advantages is related to increasing the throughput of the work production by allowing at least two workpieces to be processed simultaneously. In *Morita*, the work load of a worker is reduced as the alignment operation and the exposure operation are carried out at the same height levels, see lines 35-45, column 18 of *Morita*.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so, see *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006). As the nature of the problem to be solved, the teachings of the cited references, and the knowledge of persons of ordinary skill in the art do not provide motivation to combine references, it is clear that there is no teaching, suggestion, or motivation to combine *Morita* and *Iwatsuki* in order to make the claimed invention is found in the cited references.

Furthermore, as none of the cited references teaches the feature of applying ink on a media loaded on said printing table assembly, wherein during said applying said printing table assembly passes by said array of inkjet nozzles in said back and forth movements and said array of inkjet nozzles is substantially static on said linear Y axis, the combination of the cited references cannot provide the solution that is disclosed in Claim 1.

In light of the above discussion, with respect to the aforementioned changes, Applicant has amended independent claim 22 to more clearly emphasize the feature of applying ink on a media loaded on said printing table assembly, wherein during said applying said printing table assembly passes by said array of inkjet nozzles in said back and forth movements and said array of inkjet nozzles is substantially static on said linear Y axis. Furthermore, it is believed that the dependent claims 1-11 and 22-31 are allowable as being dependent on allowable main claims.

Claims 13-19 are rejected under USC 103(a) as being obvious over *Iwatsuki* et al in view of *Codos* et al (hereinafter: *Codos*) U.S. Patent No. 6,755,518 and *Rasmussen* et al (hereinafter: *Rasmussen*) U.S. Patent No. 6,536,894. *Codos* discloses a printing method and apparatus for ink jet printing on rigid panels using a number of movable printheads, see abstract of *Codos*. *Rasmussen* discloses a print media preheating method and apparatus that uses heat, vacuum and mechanisms for drying and flattening a sheet prior to ink-jet printing thereon, see abstract of *Rasmussen*. Neither *Codos* or *Rasmussen* nor the combination thereof with *Iwatsuki* discloses or implies a printing device for applying ink on a media loaded on a printing table assembly, as disclosed in claim 13.

The arguments made above in respect of the non-obviousness of claims 1 and 22 apply *mutatis mutandis* to independent claim 13. It is believed that Claims 14-19 are now allowable as being dependent from allowable independent Claim 13.

It should be noted that none of the citations mentioned by the Examiner, or the combination thereof, disclose an X motion printing device with a Y motion printhead which is static during applying of ink on a media loaded on a printing table assembly, as defined by present amended claims 1, 13, and 22.

All of the matters raised by the Examiner have been dealt with and are believed to have been overcome. In view of the foregoing, it is respectfully submitted that all the claims now pending in the application are allowable over the cited reference. No new matter is added by the present amendments. An early Notice of Allowance is therefore respectfully requested.

Respectfully submitted,



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Enclosed:
Request for Continued Examination (RCE).